TBD04 – (Part 04) Lipids

Name _____

1. B.4.1 **Compare** the composition of the three types of lipids found in the human body. (3) *Examples include triglycerides (fats and oils), phospholipid (lecithin) and steroids (cholesterol).*
   a. What is a lipid?
   b. Compare the three kinds:

	Similarities	**Differences**
Triglycerides		
Phospholipid		
Steroid		

2. B.4.2 **Outline** the difference between HDL and LDL cholesterol and outline its importance. (2)

3. B.4.3 **Describe** the difference in structure between saturated and unsaturated fatty acids. (2) *Most naturally occurring fats contain a mixture of saturated, mono-unsaturated and poly-unsaturated fatty acids and are classified according to the predominant type of unsaturation present.*
   a. Saturated v unsaturated?

   b. Why can't a saturated fatty acid react with a halogen?

   c. Sketch (roughly) a saturated and unsaturated fatty acid:

Saturated	**Unsaturated**

d. Where do saturated and unsaturated fatty acids originate?

4. B.4.4 **Compare** the structures of the two essential fatty acids linoleic (omega–6 fatty acid) and linolenic (omega–3 fatty acid) and state their importance. (3)

	Linoleic (Omega-6)	**Linolenic (Omega-3)**
Structure		
Facts/Function/etc		

a. Describe trans-unsaturated and hydrogenated fats, where are they found, what do they behave like?

5. B.4.5 **Define** the term iodine number **and calculate** the number of C=C double bonds in an unsaturated fat/oil using addition reactions. (2) *The number of moles of I2 reacting with one mole of fat/oil indicates the number of double bonds present in the fat/oil molecule.*
   a. Definition for Iodine number:

   b. Example calculation for Calculating Iodine number (follow slide):

6. B.4.6 **Describe** the condensation of glycerol and three fatty acid molecules to make a triglyceride. (2)
   a. What are the parts that go into making a triglyceride? Draw them:

7. B.4.7 **Describe** the enzyme-catalysed hydrolysis of triglycerides during digestion. (2)
   a. Hydrolysis cannot be achieved directly because……
   b. Hydrolysis is the opposite of _____, and is what?
   c. What goes into breaking down triglycerides, explain and describe the process…

8. B.4.8 **Explain** the higher energy value of fats as compared to carbohydrates. (3)

9. B.4.9 **Describe** the important roles of lipids in the body and the negative effects that they can have on health. (2)
   Important roles include: the risk of heart disease, cholesterol. Negative effects include: fatty acids; fats, in particular lauric (C12), myristic (C14) and palmitic (C16) acids
   a. Major function of Lipids:

   b. Structural function:

   c. Role of individual Lipids
      i. Phospholipids

      ii. Lipoproteins

      iii. Steroids

      iv. Omega-3

      v. Mono-unsaturated fat

      vi. Animal fat

      vii. Transfats